

Atlantic Scientific Review Group

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*Established under the Marine
Mammal Protection Act to advise
the National Marine Fisheries
Service and U.S. Fish and Wildlife
Service on the status of marine
mammal stocks off the Atlantic and
Gulf Coasts.*

Dr. Paul Doremus
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Dear Dr. Doremus,

The Atlantic Scientific Review Group (ASRG) met via webinar on February 22–24, 2021. We appreciate the work done by NOAA and US Fish and Wildlife Service staff to prepare for this meeting. We were pleased to welcome back returning members Andrew Read, Robert Kenney, and Geneviève Nessler, and we welcomed our newest member Yong Chen. All members were able to attend the meeting. The newly elected ASRG Chair is James Powell and Vice Chair is Richard Merrick.

The ASRG has several recommendations for the National Marine Fisheries Service (NMFS) as follows:

1. The ASRG commends NOAA for the inclusion of a total mortality estimate (i.e., effectively the sum of observed and “cryptic” mortality) within the North Atlantic right whale (NARW) stock assessment report (SAR). The ASRG recommends that NOAA reassess the 1:1 apportionment of mortality between the US and Canada based on recently observed M/SI. Also, the ASRG recognizes that there is likely more M/SI resulting from entanglements than vessel strikes, and recommends that NOAA review analyses by Pace et al. (2021), Linden (2021), Sharp et al. (2019), and Moore et al. (2020) to assign an interim apportionment by cause of mortality in the 2020 SAR.

The current draft NARW SAR for 2019 (Table 1) estimates an Nbest of 368, Nmin of 364, Rmax of 0.04, Fr of 0.1, and hence a PBR of 0.7. Table 2 provides an estimate of observed average total mortality and serious injury of 7.7 for 2015-2019 and, once cryptic mortality is included, an estimated total mortality of 27.4. For that same period, the average calf count was 6.7 (Pettis et al. 2020). Thus, in this recent period, the population declined by 20 individuals per year, with an estimated mean annual population growth rate of -0.054 (-19.7/368). PBR was exceeded by a factor of almost 40 times (27.4/0.7).

Thus, we conclude that focusing PBR only on serious injuries and mortalities fails to consider the impacts that sublethal injuries (and the resulting reduction in reproduction) has on species recovery. Just as lethal takes have increased substantially in both the US and Canada, so have the number of whales with evidence of sublethal trauma. As stated in this report: “The available evidence suggests that at least some of the observed variability in the calving rates of North Atlantic right whales is related to variability in nutrition (Fortune et al., 2012) and possibly increased energy expenditures related to non-lethal entanglements (Rolland et al., 2016; Pettis et al., 2017; van der Hoop et al., 2017).” Therefore, at this time, especially for the few remaining mature females, it is critical to better understand and account for the relationship between nutrition and entanglement, and other stressors such as sub-lethal vessel strike and noise in the energetic budget of this species. We must not only reduce mortality, but also enhance reproduction by minimizing, if not removing, those anthropogenic stressors that we can manage. We can do little about the prey base of the species, but it is critical that future SARs begin to enumerate and report trends in sublethal trauma and individual health to better guide management efforts to truly effect recovery of this species as required by the MMPA and ESA. To these ends, we urge the agency to develop and use the tools and approaches reviewed in Fauquier et al. (2020) and Moore et al. (2021).

Furthermore, we point to the current SERDP project¹ “Towards an Understanding of the Cumulative Effects of Multiple Stressors on Marine Mammals,” which has a NARW Case Study, focused on modelling the population consequences of such multiple stressors, with Cape Cod Bay as the field site. Ensuring acquisition of data to parameterize these models is critical to understand the demographic effects of sub-lethal trauma.

2. The ASRG is concerned by the apparent lack of funding for long-term marine mammal monitoring in the Gulf of Mexico to support stock assessments required by the MMPA, and recommends that NOAA prioritize survey data collection and analysis in the SEFSC’s budget. NOAA should not rely on external research funding to conduct routine monitoring.
3. The ASRG would like to commend NMFS for continuing to develop and improve the functionality of the NARW Decision Support Tool (DST). The DST fills an important need by attempting to quantify the risk-reduction benefit assigned to different management strategies. This also allows for more targeted actions that can maximize the benefit to right and other large whales, while minimizing the impact on the fishing industry. As the DST continues to be updated, refined, and expanded to other species, the ASRG recommends:
 - a. Pursue methodologies to validate the model by conducting hindcasts where possible, or by identifying a subset of entanglements for which hindcasts could be performed. The ASRG realizes that most right whale entanglements cannot be traced to a source or point of entanglement. As the DST moves to incorporate other species of large whales, it could be possible to analyze other known

¹ <https://serdp-estcp.org/Program-Areas/Resource-Conservation-and-Resiliency/Natural-Resources/Living-Marine-Resources-Ecology-and-Management/RC20-1097/RC20-1097>

- entanglement cases for which the point of entanglement is known, such as anchored animals. Some species, such as minke whales, are anchored relatively frequently when entangled and could provide a larger dataset of cases in which details are known about the location and nature of entangling gear.
- b. Continue to build, expand, and share the DST so that it can be utilized for other species and gear types. This should include integrating other types of fixed gear and expanding areas of concern. This extension to other species could include small cetaceans, sea turtles, and seals.
 - c. Upgrade the utility of the DST by improving the fishery information that informs it. One of the major issues with the current version of the DST is the lack of fine-scale spatial fishing effort information, especially in federal waters. The ASRG believes it is imperative to begin collecting this information with significantly better coverage and precision and, therefore, recommends that NMFS requires vessel monitoring systems on all federally permitted fixed-gear fishing vessels. Without this information, NMFS will be unable to deliver on the requests to target new regulations to areas of highest risk and the DST will not be able to provide the fine-scale risk and impact analyses for which stakeholders are asking.
 - d. Work to pair the DST with other models being developed, such as the Pace, Linden, and Population Evaluation Tool models, to develop a tool for a Management Strategy Evaluation.
4. The ASRG commends NOAA for preparation of its “North Atlantic Right Whale (*Eubalaena glacialis*) Vessel Speed Rule Assessment.” We continue to support the use of speed restrictions to reduce lethal vessel strikes, which are responsible for at least one-quarter of observed Serious Injuries and Mortalities for North Atlantic right whales. We are particularly troubled by the lack of compliance with speed restrictions in the Southeast and Mid-Atlantic, and with the lack of restrictions on vessels under 65 feet in length. In this regard, we suggest that NOAA consider new rulemaking to address these issues, and consider supporting this rulemaking by modeling the risk reduction of alternatives using a modified version of NOAA’s Decision Support Tool. A variety of alternatives or scenarios should be considered as part of this including:
 - a. Spatial/temporal non-voluntary speed restrictions ranging from:
 - i. A single speed restriction for the entire U.S. Northwest Atlantic Ocean shelf, at a speed that could be modeled to achieve the necessary risk reduction;
 - ii. Expanded Seasonal Management Areas (SMAs) reflecting a combination of the original SMAs coupled with additional SMAs for areas of recently observed high right whale abundance south of Block Island to Nantucket Island as well as areas in the Mid-Atlantic which have had frequent Dynamic Management Areas; and
 - i. Status quo (the existing SMAs and the historical pattern of DMAs) for comparison, recognizing that this option is clearly inadequate.
 - b. Maximum 10-knot speed requirement on all vessels under these spatial/temporal restrictions versus status quo of maximum 10-knot speed limit only for vessels greater than 65 feet (we note that a speed restriction on smaller vessels also improves safety for vessel operators).

- c. A scenario considering how continued climate instability might affect the pattern of DMAs.
- d. Effects of increased vessel traffic in support of windfarm construction and maintenance.

With respect to the recommendations of the report, the ASRG strongly supports:

- e. An expansion of the current SMAs (in particular to include the areas from south of Block Island to Nantucket Island).
- f. A continuation of the use of the DMA tool but with the change that these be required (rather than voluntary) 10-knot speed restrictions. We further suggest that NOAA investigate “frameworking” this regulation (as is the case with many Magnuson Act regulations) to facilitate the speed of implementation of any DMA closure.
- g. Require all vessels within an SMA or DMA to conform to the 10-knot speed restriction.

Finally, we support both research recommendations within the report. We also suggest that NOAA develop a tool similar to the North Atlantic right whale Decision Support Tool that can be used to support vessel strike risk reduction analyses throughout the US EEZ.

5. The ASRG notes continuing discrepancies in the number of decimal places used for the CV of Nbest when calculating Nmin and PBR. This can result in substantial differences in these calculations, particularly for larger stocks, as has been discussed at several previous ASRG meetings. The ASRG recommends NOAA decide on an appropriate number of decimal places to use when reporting and using estimates of the CV of Nbest and be consistent in their calculations of Nmin and PBR across all stocks.
6. NEFSC SARs:
 - a. The ASRG noted the recent increase in gray seal serious injury and mortality in the Northeast Sink Gillnet fishery, which exceeded 2,000 individuals for the first time in 2019, exceeding the current PBR of 1,364. At the same time, we note that the U.S. portion of this trans-boundary stock continues to increase rapidly, at least as reflected by pup counts at most colonies. The best available scientific information indicates that this robust stock of gray seals continues to recover, driven, at least in part, by emigration from large Canadian colonies, such as that on Sable Island. Thus, the ASRG recommends:
 - i. The NEFSC work towards refining the abundance of gray seals in the SAR by calculating the proportion of time the entire population of seals spends in U.S. waters. This could be established by a coordinated program of satellite telemetry in the U.S. and Canada, together with analysis of existing telemetry data. Particular care should be given to understanding the movements of juvenile seals, which dominate the bycatch in the Northeast Sink Gillnet Fishery. In the meantime, the ASRG believes that it is appropriate to calculate an interim value of Nmin by pro-rating the total estimate of abundance by the proportion of pups born on U.S. versus Canadian haul-outs.
 - ii. The SAR employ a value of Rmax of 0.128, the maximum rate of increased observed on the well-studied gray seal haul-out at Sable Island, Nova Scotia (Bowen et al., 2003).

- b. The ASRG is also concerned that the current estimate of serious injury and mortality for gray seals in the Northeast Sink Gillnet fishery is negatively biased because it does not account for mortality of entangled seals that break free from the netting. Many sub-adult and adult seals are large enough to escape from the gear but carry net fragments with them, typically around their necks. A preliminary drone survey showed a range of 1–4% of hauled out seals had such necklaces (Martins et al., 2019). These seals are likely to suffer mortality without intervention and should be counted as seriously injured. In so doing, PBR would likely be further substantially exceeded. The ASRG recommends standardized surveys be conducted by the NEFSC and its research partners to further estimate the number of seals injured in this manner on U.S. haul-out sites. It is also important to note that the magnitude of serious injury and mortality in Canadian waters is unknown and the value provided in the SAR is likely negatively biased.
 - c. The ASRG commends NOAA on the new harbor seal population model that normalizes data taken under different conditions over the years in order to produce a more comprehensive picture of the population trajectory in US waters. Due to the large uncertainty in each census, a definite decline in the overall population could not be determined. The decline in the number of pups born between the early 2000s and 2018 appears more convincing, although still not statistically significant. Listing possible factors responsible for a decline is not consistent with the finding of no significant difference, and gives the impression that one has been determined. Additional censuses taken under more controlled conditions added to the model might help determine if a decline is real.
 - d. Given the harp seal is a transboundary species, with no resident US population, our recommendation is that a PBR be calculated primarily based upon the Canadian censuses. This treatment would be consistent with other transboundary stocks of seals and cetaceans.
7. The ASRG supports the continued development of analytic tools for standardizing bycatch assessments, with the Random Forest Modeling approach being a good example. We are concerned, however, about how this tool would actually be implemented. To this end, we suggest the SRGs could host a discussion with the tool’s developers and with Center/Regional Office staff responsible for analyzing serious injuries to begin development of protocols for incorporation of the tool in the SI/M determination process. Such a discussion should include, but not be limited to:
- a. How the tool can be used to inform cryptic mortality/sublethal trauma.
 - b. Standardized assignment of typical phrases and words used in the model so as to minimize gaming outcomes.
 - c. Performance evaluation of alternative assignment of phrases/words used in model.
 - d. Consider alternate importance measure selection algorithms such as Boruta (Kursa and Rudnicki, 2010; Kursa and Rudnicki, 2018) or Altmann et al. (2010) which have been shown to perform well in a variety of settings with numerous highly correlated predictors (Degenhardt et al., 2019).
 - e. Development of standardized data-collection protocols that would be repeatable across regions.
 - f. Training of field staff for consistent collection of the data required by the tool.

If NOAA is interested in this approach, the ASRG would volunteer to start the discussion.

8. The ASRG heard with interest the presentation on the AMAPPS by Dr. Palka. During post-presentation discussions, it was recommended that NMFS consider fully implementing aerial data collection using the digital geometer system. The Department of Fisheries and Oceans in Canada has been using these during aerial survey efforts since 2016 and finds them to significantly improve the speed and quality of data collection. As a means to facilitate this, Dr. Lawson will send Dr. Palka copies of DFO's custom visual survey software and user manual that has recently been developed to make full use of the geometers (and as a replacement to the aging VOR software).
9. The ASRG would like to commend the NOAA cetacean stock assessment team for their efforts in exploring and developing novel approaches for the analysis of temporal changes in cetacean stock abundance. The ASRG noted that temporally stationary relationships were assumed in the analysis, which may not be realistic given the changes in the ecosystems. This stationarity assumption can be evaluated by allowing for time-varying parameters in the models, but this approach may not work given the limited data points available. Sensitivity analysis may be an alternative approach to evaluate the temporally stationary assumption. The ASRG suggests that cross validation be conducted to evaluate predictive power of this type of model. For example, the 2021 observation can be compared with the model-predicted 2021 estimates to examine if the observed value falls within the predicted confidence intervals. The ASRG further recommends that the data collected in Canada by the DFO St. Andrews Biological Station be included in the analysis to improve the sample size and spatial coverage.
10. SEFSC SARS
 - a. Given the limited number of survey observations available and considerable uncertainty in estimates of abundance generated from survey data for most marine mammal species in the Gulf of Mexico, the ASRG suggests revising trend analysis wording in the Gulf of Mexico SARs in sections on "Recent Surveys and Abundance Estimates" and "Current Population Trends," as outlined in our letter dated Feb 5, 2021, removing abundance estimates from the "Trends" section.
 - b. The ASRG commends the SEFSC for its continued efforts to include quantified effects of the Deepwater Horizon oil spill (DWH) in the Gulf of Mexico SARs and notes challenges associated with this. However, in the one case where empirical data from surveys have been available to test the model, the Gulf of Mexico western coastal stock of common bottlenose dolphin, results suggest that the model is incorrect as there are no significant differences between abundance estimates from 2011–2012 and 2017–2018. In this case, the value of DWH model-based mortality is questionable and should be removed from the SAR. In other cases, where even informal evaluation with empirical data is not possible, consistent with our recommendations from last year, we recommend moving the model-based mortality discussion to the Habitat section of the SARs for each species. Model-derived information on percent decline in abundance, annual mortalities (annual average and trends), and lost cetacean years should be presented there, along with an explanation of why the data are not incorporated into the stock assessment calculations.

- c. The ASRG recognizes the uncertainties involved with estimating bycatch from small sample sizes but notes that the absolute number of samples is a more important consideration than the percent coverage, assuming observer coverage is deployed in a representative fashion. This is an issue that the NEFSC has dealt with for a number of years for both protected species and fish (as part of the “Standardized Bycatch Reporting Methodology”) bycatch, and we recommend that SEFSC analysts consult with their peers at the NEFSC on the issue. They can also discuss how the NEFSC has determined the requisite number of samples to provide adequately precise bycatch estimates, and from this evaluate the appropriate level of observer coverage in the various elements of the shrimp trawl fishery.
 - d. The ASRG recognizes the need to increase observer coverage for the Atlantic and Gulf menhaden purse seine fisheries in the Gulf of Mexico and Atlantic Ocean, and encourages the adoption of newly developed technological approaches to observe this fishery if increasing the numbers of human observers is not possible.
 - e. NMFS staff reported that they are moving in the direction of creating individual SARs for each of the 31 BSE stocks of common bottlenose dolphins in the Gulf of Mexico. We recognize the need for individual SARs for stocks where management actions are required or likely to be required, and we also recognize the commitment of NMFS staff time for developing and maintaining individual SARs. The ASRG would like to discuss with NMFS identifying and prioritizing stocks to be documented in individual SARs as opposed to remaining in a combined BSE SAR.
 - f. The SRG supports the modeling approach developed by Garrison and Rosel (2017) to evaluate the specific identity of pilot whales seriously injured or killed in longline fisheries in the region of overlap. Given the continued warming of the Northwest Atlantic, however, and the availability of a large number of satellite tags deployed recently on short-finned pilot whales in this region, the SRG recommends a re-appraisal of the northern limit of the distribution of this species and the approach used in the modeling work of Garrison and Rosel (2017).
11. The ASRG appreciated the presentation on offshore wind energy and aquaculture development and their potential impacts on marine mammal stocks in the Northwest Atlantic. We would appreciate being updated regularly on this issue and are available to provide scientific review, as needed. We also request a briefing at our next meeting on mitigation plans for windfarm development.
 12. The ASRG commends NOAA for development of new range maps that include acoustic data as presented at our February 2020 meeting. We support rapid development of these maps and would welcome information on their anticipated roll out in all SARs.
 13. The ASRG believes that the departure last year from the ASRG of the long-serving representative from the environmental nongovernmental community (e.g., in this case The Humane Society of the United States) represents the loss of an important perspective on marine conservation. In this regard, the ASRG requests that NOAA Fisheries solicit a new representative from the conservation NGO community; such an individual should have a strong science background in protected species conservation. If NOAA is concerned that the addition of another member would make the ASRG too large, there are individuals on the ASRG who are willing to step down for this replacement.

The ASRG thanks NOAA staff for their continued high-quality marine mammal science, for their presentations at our meeting, and for their responsiveness to our many questions.

With best regards,



Geneviève Nesslage
Chair, Atlantic Scientific Review Group

CC:

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